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(19)



## (54) HAND TOOL

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 VORRICHTUNGS- UND GERATEBAU  
 SPERRLUTTERTAL, a body corporated  
 organised according to the laws of Germany of  
 5 D3424 St. Andreasburg, Germany, do hereby  
 declare the invention for which we pray that a  
 patent may be granted to us, and the method  
 by which it is to be performed, to be part-  
 10 icularly described in and by the following  
 statement:-  
 This invention relates to a power-operable  
 hand tool for folding down upright flange  
 portions at the edges of metal or other tough  
 sheet material. Normally, such upright flange  
 15 portions will extend initially substantially at  
 right angles to the remainder of the sheet.  
 As is known, metal sheets in doors, ceilings  
 and other structures are commonly joined  
 together by folding back the edges. This folding  
 20 back operation has hitherto been carried out  
 with roller machines, presses or by knocking  
 round by hand. Also, electromotively and  
 pneumatically operated hand tools are known  
 for pressing together sheet metal edge portions  
 25 that are already folded back at an acute angle.  
 Beating sheets together by hand is strenuous,  
 time-consuming and very noisy. If roller  
 machines and presses are used, the parts to be  
 worked, which are often very bulky and heavy,  
 30 have to be carried to the machine.  
 It is an object of the invention to provide a  
 mobile device with which sheet metal edges can  
 be folded back on site so that it is no longer  
 necessary to use the expensive roller machines  
 35 and presses or to beat round by hand the  
 upright sheet metal edges in order to fold them  
 back.  
 The invention provides a power-operable  
 hand tool for folding down an upright flange  
 40 portion at the edge of sheet material, which  
 comprises a longitudinally extending jaw for  
 supporting the underside of the sheet during  
 said folding operation, an operating jaw  
 pivotally mounted about an axis extending  
 45 parallel to the longitudinal axis of the support

jaw, and having a main pressing surface cor-  
 responding to the desired final profile of the  
 folded flange, drive means for causing pivoting  
 of the operating jaw, said drive means being  
 connectable to a source of motive power 50  
 therefor, wherein the end portion of the  
 operating jaw remote from the main pressing  
 surface is formed with a lug or rim capable of  
 engaging over the edge of an upright flange  
 portion to be folded down, the profile of the 55  
 effective surface of the operating jaw from the  
 lug to the main pressing surface being so curved  
 or inclined that, when the tool is moved along  
 the flange portion that is to be folded, each  
 section of the flange is first engaged by the lug 60  
 or rim and then progressively folded down by  
 successive portions of the operating jaw.

Hand tools made according to the invention  
 can provide the advantage that, as a result of  
 the special shaping of the operating jaw, an 65  
 upright flange portion at the edge of sheet  
 material can be folded back in one operation by  
 moving the tool, operating with a continuous  
 stroke sequence, along the edge.

One form of hand tool according to the 70  
 invention has a grip housing, and the drive  
 means includes a drive rod, mounted in the  
 grip housing, and arranged for automatic or  
 manually-controlled sequence. The grip  
 housing is preferably so designed that it permits 75  
 the operating and/or support jaw to be changed  
 to suit different thicknesses of sheet material  
 and different fold shapes. The hand tool can be  
 operated electrically, hydraulically or  
 pneumatically. 80

A hand tool according to the invention may  
 comprise a longitudinally extending supporting  
 jaw for lying flat against the underside of the  
 sheet metal and an operating jaw extending  
 parallel thereto and drivable in a swivel 85  
 movement about an axis parallel to the long-  
 itudinal axes of the jaws, wherein there is  
 provided, on one end of the operating jaw, a  
 lug or rim that is engageable in the manner of  
 a hook over an upright sheet metal edge, and 90

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adjoining this lug there is provided a curved or inclined folding back portion which continues into a main pressing surface of the operative jaw, the main pressing surface corresponding to the desired final profile of the folded flange.

One form of hand tool according to the invention will now be described, by way of example, with reference to the accompanying drawings, in which:—

- 10 Fig. 1 is a diagrammatic view of the hand tool, partly in longitudinal section;  
 Fig. 2 is a plan view of the tool;  
 Fig. 3 is a front view of the pressing jaws; and  
 Fig. 4 is a diagrammatic perspective view showing the hand tool in operation.

15 Referring to the drawings, the hand tool has a grip housing 1, at the front of which a transmission arm 2 is mounted for rotation about an axis 3, and at the rear of which is a screw-mounted high-pressure hydraulic cylinder 4.

20 The piston stroke of the hydraulic cylinder 4 is transferred to the transmission arm 2 by means of a drive push rod 5. A stationary supporting jaw 6 and an operative jaw 7, which is pivotable back and forth in the direction of the arrow A (Fig. 1), are secured to the housing 1 and the transmission arm 2 respectively each by means of two screws. The set screws for the operative jaw 7 are indicated by 8 in Fig. 2. By means of a high pressure tube 9, the hand tool is connected to a hydraulic power source which is not shown. Accommodated in the hand grip 10 is an electroswitch 11 for activating an individual or continuous stroke of the operative jaw 7.

35 The method of operation of the described hand tool is as follows:

The tool is held in both hands (on the housing and on the hand grip 10) and advanced to the sheet metal edge 12 that is to be folded back. When the switch 11 is pressed, the hydraulic cylinder 4 is actuated, and the operative jaw 7 is thereby pivoted towards the upright sheet metal edge 12 to be folded back. The folding process is started by the lug 13 on the leading end of the hand tool, which engages over the sheet metal edge while still vertical. The curved or inclined portion next to the lug 13 and the immediately adjacent supplementary folding-back portion 14 (see Fig. 4) have the effect, on pivoting of the jaw 7, of folding back the raised edge 12 in the desired direction. The sheet metal edge 12 is then folded back parallel to the sheet 18 (Fig. 4), or against a folded edge 16 of a fastening sheet 17 (Fig. 1), by means of the following plane section 15 of the operative jaw. Thus, the folding back of the sheet metal edge is initiated by the lug 13, and is completed by the following flat pressing surface 15 of the jaw 7.

Depending on the shape of the jaws it is

possible also to produce round or curved folded joints in essentially the same manner.

WHAT WE CLAIM IS:—

1. A power-operable hand tool for folding down an upright flange portion at the edge of sheet material, which comprises a longitudinally extending jaw for supporting the underside of the sheet during said folding operation, an operating jaw pivotally mounted about an axis extending parallel to the longitudinal axis of the support jaw, and having a main pressing surface corresponding to the desired final profile of the folded flange, drive means for causing pivoting of the operating jaw, said drive means being connectable to a source of motive power therefor, wherein the end portion of the operating jaw remote from the main pressing surface is formed with a lug or rim capable of engaging over the edge of an upright flange portion to be folded down, the profile of the effective surface of the operating jaw from the lug to the main pressing surface being so curved or inclined that, when the tool is moved along the flange portion that is to be folded, each section of the flange is first engaged by the lug or rim and then progressively folded down by successive portions of the operating jaw.
2. A hand tool according to claim 1, wherein said drive means includes a drive rod mounted in a grip housing.
3. A hand tool according to claim 2, which includes means for enabling said drive rod to be operated in a manually or automatically controlled sequence.
4. A hand tool according to any one of claims 1 to 3, wherein the drive means is operable by fluid under pressure.
5. A hand tool according to any one of claims 1 to 4, wherein at least one of the jaws is exchangeable.
6. A hand tool according to any one of claims 1 to 5, wherein the main pressing surface is planar.
7. A hand tool according to any one of claims 1 to 6, which is capable of working metal sheet material.
8. A power-operable hand tool for folding down an upright flange portion at the edge of sheet metal, comprising a longitudinally extending supporting jaw for lying flat against the underside of the sheet metal and an operating jaw extending parallel thereto and drivable in a swivel movement about an axis parallel to the longitudinal axes of the jaws, wherein there is provided, on one end of the operating jaw, a lug or rim that is engageable in the manner of a hook over an upright sheet metal edge, and adjoining this lug there is provided a curved or inclined folding back portion which continues into a main pressing surface of the operative jaw, the main pressing

surface corresponding to the desired final  
profile of the folded flange.

9. A hand tool substantially as hereinbefore  
described with reference to, and as shown in,  
5 the accompanying drawings.

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2 SHEETS

COMPLETE SPECIFICATION

This drawing is a reproduction of  
the Original on a reduced scale.  
SHEET 1

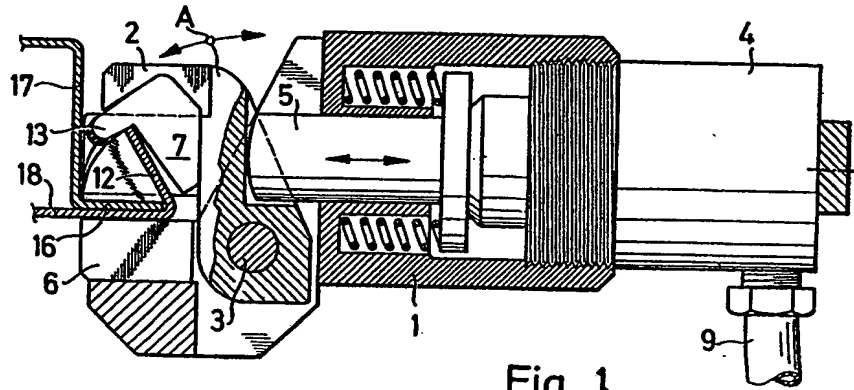


Fig. 1

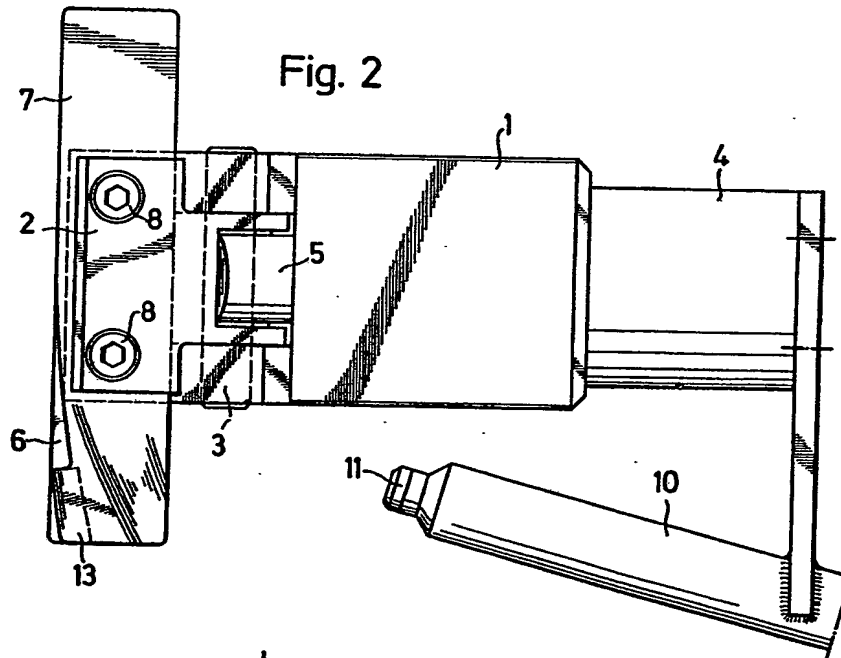


Fig. 2

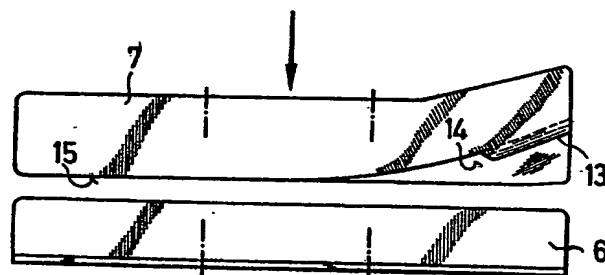


Fig. 3

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